

# **ANIMAL AND NATURAL RESOURCES INSTITUTE DIRECTORY**

## ***SY's and their Specialties***



**USDA, AGRICULTURAL RESEARCH SERVICE  
Henry A. Wallace Beltsville Agricultural Research Center  
10300 BALTIMORE AVENUE  
BELTSVILLE, MARYLAND 20705-2350  
(301) 504-8431**



ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE AGRICULTURAL RESEARCH CENTER,  
BARC-EAST  
BELTSVILLE, MARYLAND 20705-2350

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## ANIMAL AND NATURAL RESOURCES INSTITUTE

**Dr. Thomas J. Sexton, Director**

[tsexton@anri.barc.usda.gov](mailto:tsexton@anri.barc.usda.gov)

301/504-8431

**Dr. David Granstrom, Associate Director**

[dgranstrom@anri.barc.usda.gov](mailto:dgranstrom@anri.barc.usda.gov)

301/504-8310

Building 209, BARC-East  
Beltsville, MD 20705-2350  
FAX: 301/504-8553

**Mission:** The research mission of the Animal and Natural Resources Institute is to conduct research and to development technology transfer programs that ensure high quality and safe food while protecting the natural resource base and the environment.

The Institute is comprised of 12 laboratories and 3 service units:

Animal Improvement Programs Laboratory  
Animal Manure and By-Products Laboratory  
Animal Parasitic Diseases Laboratory  
Biotechnology and Germplasm Laboratory  
Bovine Functional Genomics Laboratory  
Environmental Microbial Safety Laboratory  
Environmental Quality Laboratory  
Food Technology and Safety Laboratory  
Growth Biology Laboratory  
Hydrology and Remote Sensing Laboratory  
Instrumentation and Sensing Laboratory  
Sustainable Agricultural Systems Laboratory

Veterinary Services Unit  
Administrative Unit

**ANIMAL IMPROVEMENT PROGRAMS LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-8334    FAX 301/504-8092**

**Mission:** The Animal Improvement Programs Laboratory conducts research to discover, test, and implement improved genetic evaluation techniques for economically important traits of dairy cattle and goats. Research is directed at genetic improvement of efficiency of yield (milk, fat, and protein) and fitness traits that affect health and profitability (calving ease, conformation, longevity, mastitis resistance, and reproduction). Genetic improvement is fostered nationally and internationally through collaboration with Dairy Herd Improvement, artificial-insemination, and breed registry organizations and distribution of evaluations developed.

**Dr. H. Duane Norman**

Research Leader  
Supervisory Geneticist (Animal)  
Bldg. 005, Rm. 304, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8660  
email: [dnorman@aipl.arsusda.gov](mailto:dnorman@aipl.arsusda.gov)

Coordinates the research effort to improve genetic evaluation of dairy animals, the operation of USDA-DHIA evaluation systems, and policy with industry cooperators. Oversees the maintenance and improvement of the national research database. Conducts research using milk and component yields, fitness, and health traits.

**Dr. John B. Cole**

Research Geneticist (Animal)  
Bldg. 005, Rm. 320, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8665  
email: [jcole@aipl.arsusda.gov](mailto:jcole@aipl.arsusda.gov)

Investigates genetic differences among dairy cattle for calving ease, persistency of yield, and health traits. Evaluates changes in genetic diversity in U.S. dairy cattle over time. Develops strategies for including climatic data in the national database and using those data to study the impact of climate on national dairy cattle evaluations.

**Dr. Melvin T. Kuhn**

Research Geneticist (Animal)  
Bldg. 005, Rm. 318, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8592  
email: [mkuhn@aipl.arsusda.gov](mailto:mkuhn@aipl.arsusda.gov)

Investigates genetic evaluation methods for fertility and health traits.

**Dr. Paul M. VanRaden**

Research Geneticist (Animal)  
Bldg. 005, Rm. 316, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9438  
email: [paul@aipl.arsusda.gov](mailto:paul@aipl.arsusda.gov)

Investigates genetic differences among dairy cattle for yield, longevity, fertility, and udder health traits. Determines economic values for traits included in Net Merit. Examines effects of inbreeding, crossbreeding, and non-additive genetic merit. Develops new statistical methods to improve national and international genetic evaluations.

## **Animal Improvement Programs Laboratory**

### **Dr. Curtis P. Van Tassell**

Research Geneticist (Animal)  
Bldg. 200, Rm. 4B, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-6501  
email: [curtvvt@aipl.arsusda.gov](mailto:curtvvt@aipl.arsusda.gov)

Works between the Bovine Functional Genomics Laboratory and the Animal Improvement Programs Laboratory. Develops and implements methodologies for detection and characterization of quantitative trait loci (QTL) in cattle. Designs, conducts, and evaluates research to improve systems used in the national and international genetic evaluation of dairy cattle. Develops bioinformatic tools to acquire, store, and analyze genomic data.

### **Dr. George R. Wiggans**

Research Geneticist (Animal)  
Bldg. 005, Rm. 322, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8407  
email: [wiggans@aipl.arsusda.gov](mailto:wiggans@aipl.arsusda.gov)

Investigates methods to improve accuracy of genetic evaluations of yield traits, type traits, and calving ease. Conducts genetic evaluation of dairy goats. Advises on procedures to develop, improve, and access the national database and on distribution of evaluation information.

**ANIMAL MANURE AND BY-PRODUCTS LABORATORY**  
**ANIMAL AND NATURAL RESOURCES INSTITUTE**  
**BELTSVILLE, MARYLAND 20705-2350**  
**PHONE 301/504-9100      FAX 301/504-8162**

**Mission:** The Mission of the Animal Manure and Byproducts Laboratory (AMBL) of the Henry A. Wallace Beltsville Agricultural Center is to conduct research on methods to reduce the footprint of animal agriculture on the environment, to find innovative means to address existing environmental concerns, and to find environmentally favorable uses for agricultural and industrial by-products. The research effort addresses national priorities and is aimed at the development of methods that enhance: nutrient extraction, reduce or transform waste or by-product outflows, utilize agronomic practices to remediate environmental problems, and produce value-added products from agricultural or industrial waste. The overall goal of these approaches is to reduce the environmental effects of intensive animal agriculture on the environment.

Specific research areas include: 1. development of approaches that enhance manure and by-product nutrient extraction, and reduce outflows of solid, aqueous, airborne carbon, nitrogen, phosphorus, and trace elements emissions or transform them from environmentally unfriendly to benign or beneficial; 2. development of programs to increase the uptake of heavy metals by crops, and that reduce their bio-availability to the human food chain; and 3. development of value added products from agricultural and industrial wastes and by-products.

**Dr. Matt C. Smith**

Research Leader  
Supervisory Agricultural Engineer  
Bldg. 306, Rm. 108, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9100  
email: msmith@anri.barc.usda.gov

Conducts research on treatment of animal manures with emphasis on low-input, sustainable, aquatic treatment systems. Studies the environmental impacts of manure management practices at multiples scales including modeling of potential hydrologic and water quality impacts of agricultural management practices. Engineering design of pilot- and full-scale treatment units and complete systems.

**Dr. Rufus L. Chaney**

Research Agronomist  
Bldg. 007, Rm. 013, BARC-West  
Beltsville, MD 20705-2350  
301/504-8324  
email: chaneyr@ba.ars.usda.gov

Conducts research on the characterization of Cd uptake, transport in plants, and bioavailability to animals; benefits/risks associated with land application of diverse organic resources; and remediation of toxic element contaminated soils using hyperaccumulator plants or biosolids.

**Dr. Eton E. Codling**

Research Agronomist  
Bldg. 007, Rm. 009, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5708  
email: codlinge@ba.ars.usda.gov

Focus is determining the bioavailability to mammals of Pb and As in crops grown on soils with a history of lead arsenate application, evaluate soil amendments to reduce the transfer of Pb and As to crops and identify plants that could be used as As accumulators.

## **Animal Manure and Byproducts Laboratory**

### **Dr. Thanh H. Dao**

Soil Scientist  
Bldg. 306, Rm. 121, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8315  
email: thdao@anri.barc.usda.gov

Focus is on environmental interactions and consequences of phosphorus emitted from animal systems. Research includes assessment of forms and availability of phosphorus in wastes from animal systems and the evaluation of technology to limit environmental consequences.

### **Dr. Robert S. Dungan**

Research Soil Scientist  
Bldg. 306, Rm. 113A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9840  
email: rdungan@anri.barc.usda.gov

Conducts research to identify the benefits and risks of using foundry sand in agricultural production systems and other related industries. Studies the fate and transport of organic and inorganic degradation products from foundry sand additives and of component blends using foundry sand and agricultural by-products.

### **Dr. John J. Meisinger**

Research Soil Scientist  
Bldg. 163F, Rm. 6, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5276  
email: jmeisinger@ba.ars.usda.gov

Conducts field and laboratory research comparing efficiency of fertilizer nitrogen and manure under different tillage systems. Studies nitrogen transformations, managing animal wastes while protecting water quality and the prediction of crop nitrogen needs.

### **Dr. Walter W. Mulbry, III**

Research Microbiologist  
Bldg. 001, Rm. 227, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-6417  
email: mulbryw@ba.ars.usda.gov

Conducts basic and applied research on biological systems for the treatment of manures and other agricultural wastes. Characterizes byproducts of biological treatment processes and develops strategies for cost-effective on- and off-farm use of these materials.

### **Dr. James B. Reeves, III**

Research Chemist  
Bldg. 306, Rm. 101A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2300  
301/504-8294 or 7192  
e-mail: jreeves@anri.barc.usda.gov

Focus is on the development and validation of analytical methods for the measurement of nitrogen (N) and phosphorus (P) in solid, liquid, and volatile animal waste components. Research includes near-infrared spectroscopic (NIRS) and mid-infrared spectroscopic (MIDIR) for quantitative analysis of carbon, N, P in soil and animal waste.

**ANIMAL PARASITIC DISEASES LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-8300 FAX 301/504-6273**

**Mission:** The mission of the Animal Parasitic Diseases Laboratory (APDL) is to reduce the economic cost of parasitism in livestock and poultry and decrease the risk of transmission of parasite zoonoses to humans. The laboratory utilizes a wide range of expertise to accomplish this mission, including in-depth biochemical, molecular, immunological, and epidemiological approaches as well as application of systematics and phylogenetics. Research includes basic and applied studies on (1) mechanisms of parasite transmission, the infection process, parasite development, and host-parasite interactions; (2) the development of traditional and novel methods for parasite control; (3) diagnosis and control of livestock parasites transmissible to humans; and (4) development of new information and concepts for parasite biodiversity and systematics of parasite groups of veterinary and medical importance.

**Dr. Mark C. Jenkins**

Research Leader  
Microbiologist  
Bldg. 1040, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8054  
email: mjenkins@anri.barc.usda.gov

Conducts research on the molecular genetics of parasites of food animals using various biochemical methods including recombinant DNA techniques to identify and classify parasites and to develop diagnostic probes. Develops vaccination strategies.

**Dr. Patricia C. Allen**

Research Chemist  
Bldg. 1043, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8772  
email: pallen@anri.barc.usda.gov

Studies biochemical, physiological, and immunological changes in avian tissues that lead to reduced growth during coccidia infections. Investigates and functionally characterizes developmentally related parasite genes for use as potential targets for new control strategies or as potential protective antigens, and as a means of establishing unique metabolic properties of the individual *Eimeria* species.

**Dr. John F. Carroll**

Research Entomologist  
Bldg. 1040, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/ 504-9017  
email: jcarroll@anri.barc.usda.gov

Investigates methods of suppressing populations of the black-legged tick (deer tick), vector of the pathogen causing Lyme disease and other ticks of medical and veterinary importance. Studies host-finding behavior and ecology as they relate to tick control. Conducts research on compounds that repel ticks or modify their behavior in ways that prevent tick bites.



## Animal Parasitic Diseases Laboratory

### **Dr. Jitender P. Dubey**

Microbiologist  
Bldg. 1001, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8128  
email: jdubey@anri.barc.usda.gov

Develops procedures to render meat and meat products safe from *Toxoplasma*-infection through diagnosis, epidemiology and on-farm control programs. Develops a vaccine to prevent *Toxoplasma*-induced abortion in livestock. Develops methods for the diagnosis and control of *Neospora* in domestic animals and *Sarcocystis neurona* in horses.

### **Dr. Raymond H. Fetterer**

Zoologist  
Bldg. 1040, Rm. 206, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8762  
email: rfettere@anri.barc.usda.gov

Conducts research on physiology and biochemistry of parasites, particularly related to characterizing proteins involved in development coccidia parasites of poultry. Uses proteomic techniques to identify proteins important in the biology of coccidian parasites.

### **Dr. Dolores E. Hill**

Research Parasitologist  
Bldg. 1044, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8770  
email: dhill@anri.barc.usda.gov

Conducts research on the biochemistry, molecular biology, and epidemiology of *Neospora caninum* and the zoonotic pathogens *Toxoplasma gondii* and *Trichinella spiralis*. Develops methods to detect and identify parasites and strategies for the control of animal and human parasites of food safety concern.

### **Dr. Eric P. Hoberg**

Zoologist  
Bldg. 1180, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8588  
email: ehoberg@anri.barc.usda.gov

Conducts research on the biodiversity, systematics and phylogeny of helminth parasites of animals relying on integrated approaches using comparative morphology and molecular data. Conducts analyses of coevolutionary and biogeographic relationships for nematodes of Holarctic ungulates. Serves as chief Curator, US National Parasite Collection.

### **Dr. Hyun S. Lillehoj**

Research Immunologist  
Bldg. 1043, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8771  
email: hlilleho@anri.barc.usda.gov

Conducts research on immunology, molecular biology and genomics of poultry and *Eimeria* to develop novel control strategies against avian coccidiosis. Develop chicken intestinal EST genomics database and identify candidate genes which control innate and acquired immunity to intracellular pathogens using high throughput gene expression profiling. Investigate intestinal immune system and develop *in vitro* assays to measure cell-mediated immunity against poultry pathogens. Investigate various strategies to immunomodulate gut immunity using cytokines, CpG and probiotics. Develop novel mucosal vaccination strategies to induce local immunity against *Eimeria*.

## **Animal Parasitic Diseases Laboratory**

### **Dr. Joan K. Lunney**

Research Scientist  
Bldg. 1040, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9368  
email: [jlunney@anri.barc.usda.gov](mailto:jlunney@anri.barc.usda.gov)

Investigates immunologic and genomic factors that regulate swine health and disease resistance. Analyzes functional genomic and immune controls of swine responses to vaccines, to respiratory infections, e.g., porcine reproductive and respiratory syndrome virus (PRRSV) infections, and to parasitic infections, e.g., toxoplasmosis. Investigates means to stimulate neonatal swine immune system development, and to improve vaccine responses and disease resistance at this critical state. Develops molecular reagents to assess swine immunity and to measure cell surface antigen and cytokine and chemokine protein expression.

### **Dr. Katarzyna Miska**

Research Molecular Biologist  
Bldg. 1042, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5596  
email: [kmiska@anri.barc.usda.gov](mailto:kmiska@anri.barc.usda.gov)

Develops molecular techniques to rapidly assess species composition of *Eimeria* in poultry facilities. Investigates genetic diversity of *Eimeria*. Identifies novel targets for anti-coccidia vaccines. Employs molecular techniques to study gene expression during life-cycle progression and parasite invasion.

### **Dr. Benjamin M. Rosenthal**

Molecular Systematist  
Bldg. 1180, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5408  
email: [broseuth@anri.barc.usda.gov](mailto:broseuth@anri.barc.usda.gov)

Conducts research on the molecular systematics, diagnostics, and population genetics of food borne and water borne parasites.

### **Dr. Wenbin Tuo**

Research Animal Scientist  
Bldg. 1040, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8288  
email: [wtuo@anri.barc.usda.gov](mailto:wtuo@anri.barc.usda.gov)

Investigates local and systematic immunologic mechanisms that control parasite infection. Develops vaccines against *N. caninum* infection in cattle. Studies reproductive immunology and mechanisms of congenital transmission of infectious diseases and pregnancy failure in farm animals.

**BIOTECHNOLOGY AND GERMPLASM LABORATORY**  
**ANIMAL AND NATURAL RESOURCES INSTITUTE**  
**BELTSVILLE, MARYLAND 20705-2350**  
**PHONE 301/504-8545      FAX 301/504-5123**

**Mission:** The mission of the Biotechnology and Germplasm Laboratory (BGL) is to improve the genetic, reproductive and productive efficiency of livestock through fundamental research on germplasm, gamete biology and embryology. BGL researchers are pioneering the application of functional genomics and proteomics methods, transgenics, somatic cell nuclear transfer, and related embryo biotechnologies to enable germplasm preservation and to improve oocyte maturation, embryo development and fertility in swine, dairy cattle and poultry.

**Dr. Kurt A. Zuelke**

Research Leader  
Supv. Research Physiologist  
Bldg. 200, Rm. 124, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5161  
email: [kzuelke@anri.barc.usda.gov](mailto:kzuelke@anri.barc.usda.gov)

Applying functional genomics and proteomics research tools and strategies to improve oocyte maturation, embryo development and fertility in swine and poultry.

**Dr. Murray R. Bakst**

Research Physiologist  
Bldg. 200, Rm. 103, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8795  
email: [murray@anri.barc.usda.gov](mailto:murray@anri.barc.usda.gov)

Investigating molecular mechanisms that regulate sperm selection and storage in poultry. Determining factors regulating turkey oocyte maturation and factors regulating fertilization, embryo development and early embryonic survival.

**Dr. Le Ann Blomberg**

Research Molecular Biologist  
Bldg. 200, Rm. 22A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-6338  
email: [lblomberg@anri.barc.usda.gov](mailto:lblomberg@anri.barc.usda.gov)

Analyzing factors affecting nuclear reprogramming and developmental competency in cattle and swine embryos by SAGE and microarray-based strategies.

**Dr. David M. Donovan**

Research Molecular Biologist  
Bldg. 230, Rm. 104, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9150  
email: [ddonovan@anri.barc.usda.gov](mailto:ddonovan@anri.barc.usda.gov)

Developing novel transgene constructs to convey disease resistance trait characteristics to cattle. Functional genomics analyses of factors affecting nuclear reprogramming and transgene expression during nuclear transfer in cattle.

## **Biotechnology and Germplasm Laboratory**

### **Dr. H. David Guthrie**

Research Physiologist  
Bldg. 200, Rm. 100B, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9020  
email: dave@anri.barc.usda.gov

Performing basic and applied cryobiology research to improve cryopreservation and storage of swine spermatozoa.

### **Dr. Julie A. Long**

Research Physiologist  
Bldg. 200, Rm. 120, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8580  
email: jlong@anri.barc.usda.gov

Preservation of turkey semen through liquid and cryogenic storage. Sperm physiology, artificial insemination and fertilization events.

### **Dr. John A. Proudman**

Research Physiologist  
Bldg. 200, Rm. 102, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8094  
email: johnp@anri.barc.usda.gov

Developing and applying proteomics research tools and strategies to identify and characterize proteins important in the control of growth and reproduction. Identify endocrine changes that limit egg production in turkeys.

### **Dr. Neil C. Talbot**

Research Animal Scientist  
Bldg. 200, Rm. 13, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8216  
email: ntalbot@anri.barc.usda.gov

Isolating and culturing embryo-derived cell lines from cows, pigs, and sheep to investigate nuclear reprogramming and cellular differentiation during embryo development. Performing proteomic analysis of nuclear transfer embryos and donor cells.

### **Dr. Robert J. Wall**

Research Physiologist  
Bldg. 230, Rm. 101, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5295  
email: bobwall@anri.barc.usda.gov

Alter the phenotype of cattle, sheep, and swine by introduction of foreign genes into early embryos. Determine factors which limit efficiency of producing transgenic animals.

**BOVINE FUNCTIONAL GENOMICS LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301-504-8342 FAX 301/504-8414**

**Mission:** To improve the genetic and productive efficiency and health and well-being of cattle through fundamental research on gene expression, and marker-assisted genetic selection. Research in the laboratory uses methods of immunology, molecular biology and bioinformatics to: enhance genetic selection by the identification of quantitative trait loci, identify genes that are important for enhanced productivity and disease resistance, and develop fundamental knowledge about the physiology and development of the mammary gland, the bovine immune system and gastrointestinal tract. Implicit in these endeavors is the development of molecular, biological and bioinformatic tools to facilitate functional genomic studies, and the development of management and breeding tools that enhance producer efficiency and profitability.

**Dr. Louis C. Gasbarre**

Research Leader  
Bldg. 200, Rm. 6. BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8509  
email: lgasbarr@anri.barc.usda.gov

Identifies genes that control resistance to parasitic infections in ruminants and defines the expression and regulation of resistance/susceptibility genes in infected animals, characterizes cellular immune response of cattle with special emphasis on the role of cytokines in protective immunity; develops management programs that use genetics and host immunity to control parasite infection.

**Dr. Ransom L. Baldwin, VI**

Research Animal Scientist  
Bldg. 162, Rm. 213, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8964  
email: rbaldwin@anri.barc.usda.gov

Quantitative assessment of energy metabolism in ruminant gut tissues. Identify mechanisms of cell growth and differentiation in gut tissues as affected by whole animal nutritional status and physiological state.

**Dr. Douglas Bannerman**

Research Biologist  
Bldg. 1040, Rm. 2, BARC-East  
10330 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-5066  
email: dbanner@anri.barc.usda.gov

Investigates the responses of endothelial and epithelial cells to bacterial toxins and host-derived inflammatory mediators in the setting of mastitis and systemic infection. Elucidating the intracellular signaling mechanisms by which these cells are "activated" and the role that these signaling pathways have in initiating apoptosis. Studying how activation of and/or injury to these cells contribute to the pathogenesis of mastitis and sepsis.

**Dr. Richard G. Baumann**

Bldg. 162, Rm. 211, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-8604  
email: rbaumann@anri.barc.usda.gov

Identify mechanisms regulating ruminant visceral growth and metabolism that are influenced by changes in dietary intake and physiological status. Regulation is evaluated at the genetic, cellular and whole animal levels.

## **Bovine Functional Genomics Laboratory**

### **Dr. Anthony V. Capuco**

Research Physiologist  
Bldg. 200, Rm. 14, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8672  
email: [acapuco@anri.barc.usda.gov](mailto:acapuco@anri.barc.usda.gov)

Evaluate genetic regulation of mammary gland function. Determine factors that are critical to growth and development of bovine mammary gland. Find ways to increase mammary growth, and increase the number and activity of secretory cells throughout lactation.

### **Dr. Erin E. Connor**

Research Molecular Biologist  
Bldg. 200, Rm. 4A, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-6104  
email: [econnor@anri.barc.usda.gov](mailto:econnor@anri.barc.usda.gov)

Develop detailed maps of chromosomal regions thought to contain quantitative trait loci (QTL) and saturate the regions with additional marker genotypes. Evaluate the impact of heifer management practices on genetic regulation of mammary growth and development.

### **Dr. Robert Li**

Research Molecular Biologist  
Bldg. 200, Rm. 16A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-5185  
email: [rli@anri.barc.usda.gov](mailto:rli@anri.barc.usda.gov)

Utilize genomic tools to investigate genes and pathways defining host resistance. Characterize bovine transcriptome and investigate gene expression during mammary gland development using whole genome oligo microarrays. Validate and fine-map selected quantitative trait loci (QTL) and identify causative genetic variation underlying the QTL.

### **Dr. Ge Liu**

Research Biologist (Bioinformatics)  
Bldg. 200, Rm. 4B, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-9843  
email: [gliu@anri.barc.usda.gov](mailto:gliu@anri.barc.usda.gov)

Design and apply comparative and functional genomics approaches to facilitate candidate gene(s) and mutation(s) mapping for economic traits and disease resistance. Develop bioinformatics tools to analyze genomic data and gene expression data.

### **Dr. Max J. Paape**

Research Dairy Scientist  
Bldg. 1040, Rm. 208, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-8302  
email: [mpaape@anri.barc.usda.gov](mailto:mpaape@anri.barc.usda.gov)

Determination of events and substances which mobilize polymorphonuclear leukocytes to defend against mastitis infection. Find ways to stimulate this defense to more effectively combat infections. Determine the feasibility of producing transgenic animals that are resistant to coliform mastitis.

## **Bovine Functional Genomics Laboratory**

### **Dr. Tad S. Sonstegard**

Research Geneticist  
Bldg. 200, Rm. 2B, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8416  
email: [tads@anri.barc.usda.gov](mailto:tads@anri.barc.usda.gov)

Identify causative genetic variation underlying economic trait loci (ETL) by evaluating and mapping positional candidate genes. Generate expressed sequence tags (EST) from mammary and gut tissue and evaluate gene expression in these tissues to determine genetic factors involved in regulation of growth and disease resistance.

### **Dr. Curtis P. Van Tassell**

Research Geneticist  
Bldg. 200, Rm. 125A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-6501  
email: [curtvt@anri.barc.usda.gov](mailto:curtvt@anri.barc.usda.gov)

Works between BFGL and AIPL. Develops and implements methodologies for detection and characterization of quantitative trait loci (QTL) in cattle. Designs, conducts and evaluates research to improve systems used in the national and international genetic evaluation of dairy cattle. Develop bioinformatic tools to acquire, store, and analyze genomic data.

### **Dr. Dan S. Zarlenga**

Research Molecular Biologist  
Bldg. 1180, Rm. 100, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
(301) 504-8754  
email: [dzarleng@anri.barc.usda.gov](mailto:dzarleng@anri.barc.usda.gov)

Conducts research in the general areas of molecular parasitology and transcriptional regulation of host cytokine genes resulting from parasite infection.

**ENVIRONMENTAL MICROBIAL SAFETY LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-5607      FAX 301/504-6608**

**Mission:** The mission of the Environmental Microbial Safety Laboratory is to identify, determine sources, and reduce transmission of pathogenic enteric microorganisms that affect the health of food animals and can also be transmitted to humans by contaminated food and water. The research is designed to develop and test novel methods to identify and characterize pathogenic enteric microorganisms; use the methods to determine the presence of these microorganisms in livestock, potential wild animal vectors, as well as edible plants, milk, meat, soil and water impacted by agriculture; develop physical, chemical, and immunological methods to reduce the number and virulence of these microorganisms in food and the environment.

**Dr. Daniel Shelton**

Research Microbiologist  
Bldg. 173, Room 103, BARC-East  
Powder Mill Road  
Beltsville, Maryland 20705-2350  
301/504-6582  
301/504-5760  
email: sheltond@ba.ars.usda.gov

Includes developing new methods for rapid, quantitative detection of human pathogens, elucidating environmental parameters controlling pathogen transport to surface and ground waters, assessing pathogen dispersal and survival in water, soil, manure, and produce, and developing strategies to minimize transport and dissemination of pathogens from animal manures to potable waters and fresh produce.

**Dr. Ronald Fayer**

Supervisory Zoologist  
Bldg. 173, Room 100, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-8750  
email: rfayer@anri.barc.usda.gov

To determine methods of detection, routes of transmission, methods of immunization and disinfection, and develop strategies for prevention and control of *Cryptosporidium*, *Giardia*, and *Microsporidia* infectious for food animals and humans. To investigate the potential of other protozoan parasites as zoonoses involving food animals.

**Dr. James Higgins**

Microbiologist  
Bldg. 173, Room 202, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-6443  
email: jhiggins@anri.barc.usda.gov

Conducts applied research on sample preparation techniques, and molecular diagnostic assays, for the detection and identification of pathogens associated with manure and livestock.

**Dr. Jeffrey S. Karns**

Microbiologist  
Bldg. 173, Room 201, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-6493  
email: karnsj@ba.ars.usda.gov

Develop methods for the specific detection and enumeration of pathogenic forms of microorganisms in foods, soil, manure and water. Use those methods to describe the fate of pathogens on the farm and the routes for their transmission to foods.



## **Environmental Microbial Safety Laboratory**

### **Dr. Yakov Pachepsky**

Hydrologist  
Bldg. 173, Room 203, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-7468  
email: ypachepsky@anri.barc.usda.gov

Develops functional relationships between environmental parameters and pathogen transport from animal manure; integrating information on pathogen transport and survival to improve and validate pathogen transport and dispersal models for prediction and risk assessment of pathogen transmission from animal manures to potable water and fresh produce.

### **Dr. Tagelsir Mohamed**

Microbiologist  
Bldg. 173, Room 208, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
email: tmohamed@anri.barc.usda.gov

To explore the ecological relationships of pathogens on the dairy farm environment and how they affect the entry of these pathogens into the national dairy supply. To develop novel approaches for controlling the presence of zoonotic microorganisms in the dairy supply system and evaluate farm management practices that may be put in place to prevent entry of pathogens into the milk supply.

### **Dr. James M. Trout**

Research Biologist  
Bldg. 173, Room 003, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-5841  
email: jtrout@anri.barc.usda.gov

Determines the role that livestock play in the transmission of Giardia. Develops methods to detect and characterize Giardia, determines the potential for its transmission between wild animals, domestic animals and humans. Assesses the role of animal-manure in environmental contamination, and develops methods to reduce the risks to food and water supplies.

### **Dr. Jo Ann S. Van Kessel**

Research Animal Scientist  
Bldg. 173, Room 204, BARC-East  
Powder Mill Road  
Beltsville, MD 20705-2350  
301/504-8287  
email: jkessel@anri.barc.usda.gov

Current objectives are to study the incidence of epizootic bacterial pathogens in dairy production systems, to determine management practices that will minimize pathogen contamination of bulk milk.

**ENVIRONMENTAL QUALITY LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-6511 FAX 301/504-5048**

**Mission:** Research programs in the Environmental Quality Laboratory (EQL) focus on discovering technologies for sustainable agricultural management strategies that protect our natural resources and maintain the safety and productivity of our food supply. This new knowledge provides a foundation for implementing new management strategies and developing models and risk assessment tools. Much of this research is multi-disciplinary and is conducted by scientifically diverse teams, within and outside EQL, and often in collaboration with farmers/producers and scientists from state, federal, and international agencies, universities, and industry. EQL provides national coordination for ARS's minor crop pesticide program (IR-4) and is home to one of the IR-4 residue laboratories. EQL scientists address problems described in National Programs 108 - Food Safety, 201 - Water Quality and Management, 202 - Soil Resource Management, 203 - Air Quality, 206 - Manure and By-product Utilization, 304 - Crop Protection, and 306 - Biobased products.

**Dr. Cathleen J. Hapeman**

Research Leader  
Supervisory Research Chemist  
Room 224A, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.6511  
FAX: 301.504.5048  
email: HapemanC@ba.ars.usda.gov

Conducts research to examine the physical and chemical processes that influence agrochemical and pollutant fate and transport in the water, in the atmosphere, and on soil surfaces. Examines pollutant transport to and within sensitive ecosystems especially in South Florida. Information is used to improve predictive and risk assessment models and in the development of better management practices.

**Dr. Gregory W. McCarty**

Research Soil Scientist  
Room 202, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.7401  
FAX: 301.504.5048  
email: McCartyG@ba.ars.usda.gov

Conducts research concerning the ecology and biochemistry of microorganisms in soil with specific focus on carbon and nitrogen transformations in landscapes. Investigates the fate of nutrients in riparian/wetland systems and the effectiveness of these systems to mitigate agricultural pollution. Develops new methods to measure carbon sequestration.

**Dr. Laura L. McConnell**

Research Chemist  
Room 225, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.6298  
FAX: 301.504.5048  
email: McConneL@ba.ars.usda.gov

Investigates the environmental fate of organic chemicals and the impact of these pollutants on air and water quality. Current projects range from a study of atmospheric deposition of pesticides in a Chesapeake Bay watershed to the development of analytical methods to determine odorous VOCs emissions released from agricultural operations.

## Environmental Quality Laboratory

### **Dr. James B. Reeves**

Research Chemist  
Room 101A, Bldg. 306, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
PH: 301.504.8294  
FAX: 301.504.7192  
e-mail: jreeves@anri.barc.usda.gov

Works with AMBL and EQL jointly. Conducts research on the development and validation of rapid analytical methods for the measurement of soil components. Research focuses on near-infrared (NIR) and mid-infrared (MIDIR) spectroscopic methods for the qualitative and quantitative analysis of carbon and other nutrients.

### **Dr. Clifford P. Rice**

Research Chemist  
Room 201, Bldg. 001, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.6398  
FAX: 301.504.7976  
email: RiceC@ba.ars.usda.gov

Conducts field and laboratory research on transport and fate of agrochemicals with emphasis on atmospheric fate, transport, and deposition to the Chesapeake Bay and adjoining wetlands. Examines physical and chemical properties of the compounds and the environmental factors that influence their transformation, transport and deposition. Develops trace analytical methods using LC/MS-MS instrumentation for their measurement.

### **Dr. Ali M. Sadeghi**

Research Soil Physicist  
Room 211, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.6693  
FAX: 301.504.5048  
email: SadeghiA@ba.ars.usda.gov

Studies the hydrological, physical, and biological processes and parameters influencing surface and groundwater quality. Develops/modifies environmental models that can be used in the overall framework of risk analysis for assessing risk of agrochemicals, nutrients, and pathogens in the environment.

### **Dr. Walter F. Schmidt**

Research Chemist  
Room 1-5, Bldg. 012, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.5030  
FAX: 301.504.5992  
email: SchmidtW@ba.ars.usda.gov

Identifies individual chemical forms of nutrients like phosphorus (P) which are present within a given agricultural environment, and both the mechanisms and rates through which the different forms interchange. Initiates innovative strategies to convert poultry feather keratin into a renewable environmentally-friendly biomass resource and to formulate them into prototype value-added fiber and film products.

### **Dr. Paul H. Schwartz**

Staff Scientist  
Room 212, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
PH: 301.504.8256  
FAX: 301.504.5048  
email: SchwartzP@ba.ars.usda.gov

Plans, reviews, evaluates and establishes priorities for development of data by ARS scientists for support of the registration of minor use pesticides. Special emphasis is given to safer, more environmentally-friendly compounds. Coordinates the minor use pesticide research program for ARS with State and Federal scientists.

## **Environmental Quality Laboratory**

### **Dr. James L. Starr**

Research Soil Scientist

Room 207A, Bldg. 007, BARC-West

10300 Baltimore Avenue

Beltsville, MD 20705

PH: 301.504.6888

FAX: 301.504.5048

email: [StarrJ@ba.ars.usda.gov](mailto:StarrJ@ba.ars.usda.gov)

Researches the physics of water movement and the transport and transformations of nutrients and contaminants in saturated and unsaturated soils.

Identifies and characterizes the interactive effects of soils, cropping systems, tillage, and sources of water input (rainfall and drip- or sprinkler-irrigation) on real-time soil water dynamics on the fate of agrochemicals.

**FOOD TECHNOLOGY AND SAFETY LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-8400 FAX 301/504-8438**

**MISSION:** To conduct basic and applied research on beef, pork, lamb, and other animal products to enhance their quality and safety. To develop technologies for evaluating, maintaining, and improving the quality and safety of meat and meat products.

**Dr. Morse B. Solomon**

Research Leader  
Research Food Technologist  
Bldg. 201, Rm. 105A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8463  
email: msolomon@anri.barc.usda.gov

Develop pressure-based technology and other newly emerging technologies that will improve the quality and food safety of meat products. Develop companion preservation, processing and cooking procedures necessary to fully achieve the value-added capabilities of pressure technologies. Regulation of growth and development of different biological slaughter animals for producing high lean/low fat meat, especially in relation to improving meat quality and compositional factors affecting meat palatability and wholesomeness.

**Dr. Martha N. Liu**

Research Food Technologist  
Bldg. 201, Rm. 101, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8994  
email: mnliu@anri.barc.usda.gov

Determine the effects of the hydrodynamic pressure technology and other emerging technologies on processed meat products and establish which products and processes provide the optimum quality and value for processors and consumers. Utilize sensory and rheological methods for textural examination of meat products. Provide information to federal action-regulatory agencies regarding cooked color, product specifications and cooking methodology.

**Dr. Jitu R. Patel**

Research Food Technologist/Microbiologist  
Bldg. 201, Rm. 203, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-7003  
email: jpatel@anri.barc.usda.gov

Determine the efficacy of hydrodynamic pressure (HDP) processing and other non-thermal processing technologies on inactivation of food-borne pathogens and spoilage bacteria in meat. Develop mathematical models for predicting bacterial survival and inactivation by HDP processing. Develop emerging non-thermal technologies to enhance quality and safety of meat products. Evaluate rapid and sensitive procedures for detection of healthy and stressed/injured pathogens in HDP treated meats.

## **Food Technology and Safety Laboratory**

### **Dr. Brian C. Bowker**

Research Protein Chemist  
Bldg. 201, Rm. 204, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5626  
email: [bbowker@anri.barc.usda.gov](mailto:bbowker@anri.barc.usda.gov)

Determine the structure-to-function relationship of meat components such as proteins and peptides resulting from treatment by hydrodynamic pressure and other emerging technologies that have been shown to affect meat quality. Determine how the changes are related to meat tenderness and how they may be managed to improve meat quality. Determine how these changes in quality are similar to or different from those associated with meat aging.

### **Dr. Manan Sharma**

Microbiologist  
Bldg. 201, Rm. 4, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9198  
email: [msharma@anri.barc.usda.gov](mailto:msharma@anri.barc.usda.gov)

To develop and evaluate newly emerging technologies (e.g., pressure-derived technologies) to a) reduce human pathogens from meat and meat products, and b) reduce spoilage organisms in order to extend product shelf-life.

### **Dr. Xiangwu Nou**

Microbiologist  
Bldg. 201, Rm. 2, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8991  
email: [xwnou@anri.barc.usda.gov](mailto:xwnou@anri.barc.usda.gov)

Develop novel strategies for detecting and reducing microbial contamination in meats and other food products. Assess (1) microbial safety of organic meats, ethnic meat products and other alternatively processed meats and meat products, and (2) microbial contamination of alternatively processed meats and meat products during animal slaughtering and meat fabrication. Develop strategies for improving the microbial safety of organic meats and other alternatively processed meat products. Evaluate the impact of organic farming on the ecology of the major food borne pathogens in meat animal production systems.

**GROWTH BIOLOGY LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-8222      FAX 301/504-8623**

**Mission:** The mission of the Growth Biology Laboratory is to: (1) examine pre- and post-translational genetic determinants that influence nutrient utilization for lean tissue deposition by livestock; (2) optimize and validate nondestructive techniques for the prediction of live animal composition; and (3) assess nutrient/management variables and metabolism modifiers on target animal health, well-being, product quality and safety.

**Dr. John P. McMurtry**

Research Leader  
Research Animal Scientist (Poultry)  
Bldg. 200, Rm. 217, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8803/8857  
email: mcmurtry@anri.barc.usda.gov

Control of appetite in poultry. Endocrine regulation of growth and development. Development of avian peptide hormone assays.

**Dr. Thomas J. Caperna**

Research Biologist (Swine)  
Bldg. 200, Rm. 202, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8506  
email: caperna@anri.barc.usda.gov

Control of appetite in swine. Identification of genes and gene products regulating nutrient partitioning and cellular metabolism.

**Dr. Theodore H. Elsasser**

Research Animal Scientist (Beef cattle)  
Bldg. 200, Rm. 201, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8281  
email: elsasser@anri.barc.usda.gov

Identification of novel signal transduction pathways, pathway component modifications, and biomarkers involved in pathobiological response of the host (cattle) to low-level inflammatory and noninflammatory stresses; development of pathway-based intervention strategies to limit overt complications to stress.

**Dr. Congjun Li**

Research Molecular Biologist (Beef Cattle)  
Bldg. 200, Rm. 209, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-7216  
email: cli@anri.barc.usda.gov

Identification of specific protein modifications as biomarkers of health and disease status of domestic animals, their functions in signal transduction pathways involved in animal growth regulation and low-level inflammatory response.

## **Growth Biology Laboratory**

### **Dr. Alva D. Mitchell**

Research Animal Scientist (Swine)  
Bldg. 200, Rm. 205A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8868  
email: mitchell@anri.barc.usda.gov

Develop, validate and apply methods for direct, nondestructive determination of body composition in swine and poultry.

### **Dr. Timothy Ramsay**

Research Physiologist (Swine)  
Bldg. 200, Rm. 207, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5958  
email: tramsay@anri.barc.usda.gov

Genetic control of appetite in swine. Endocrinology of growth and development. Regulation of lipid metabolism.

### **Dr. Mark P. Richards**

Research Animal Scientist (Poultry)  
Bldg. 200, Rm. 206A, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8892  
email: richards@anri.barc.usda.gov

Genetic control of appetite and energy balance in poultry. Development of gene expression assays, gene sequencing techniques and capillary electrophoresis-based methodologies.

### **Dr. Robert W. Rosebrough**

Research Animal Scientist (Poultry)  
Bldg. 200, Rm. 212, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8866  
email: rosebro@anri.barc.usda.gov

Control of appetite and energy metabolism in poultry. Regulation of lipid metabolism.



**HYDROLOGY AND REMOTE SENSING LABORATORY**  
**ANIMAL AND NATURAL RESOURCES INSTITUTE**  
**BELTSVILLE, MARYLAND 20705-2350**  
**PHONE 301/504-7490 FAX 301/ 504-8931**

**Mission:** The mission of the Hydrology and Remote Sensing Laboratory is to conduct nationally orientated basic and applied research on water resources and remote sensing concerns related to the production of food and fiber and the conservation of natural resources.

**Dr. Walter J. Rawls**

Research Leader  
Supervisory Research Hydrologist  
Room 104, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-8745  
email: [wrawls@hydrolab.arsusda.gov](mailto:wrawls@hydrolab.arsusda.gov)

Conducts research in quantifying hydraulic soil properties and the effects of land management practices on the temporal and spatial variability of infiltration characteristics. Has expertise in hydrology, soil water movement, infiltration, flood frequency, erosion, and hydrologic modeling.

**Dr. Martha Anderson**

Research Physical Scientist  
Room 120A, Bldg. 007, BARC-West  
Beltsville, MD 20705-2350  
301/504-6616  
e:mail: [manderson@hydrolab.arsusda.gov](mailto:manderson@hydrolab.arsusda.gov)

Develops multi-wavelength remote-sensing techniques for assessing the land-surface carbon, water and energy balance. Emphasis on operational methods that facilitate flux upscaling from micrometeorological to regional and continental scales. Has expertise in hydrology, remote sensing, and soil-plant-atmosphere interactions.

**Dr. Michael H. Cosh**

Research Hydrologist  
Room 129, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-6461  
email: [cdaughtry@hydrolab.arsusda.gov](mailto:cdaughtry@hydrolab.arsusda.gov)

Major research interests include temporal and spatial characteristics of land surface parameters, including soil moisture and vegetation. Conducts research in soil moisture profiles and large scale hydrologic networks for validation and calibration of satellites.

**Dr. Wade T. Crow**

Research Physical Scientist  
Room 102, Bldg. 007, BARC-West  
Beltsville, MD 20705-2350  
e:mail: [wcrow@hydrolab.arsusda.gov](mailto:wcrow@hydrolab.arsusda.gov)

Develops techniques for integrating spaceborne and aerial remote sensing with hydrologic and land surface models. Major research interests include the spatial scaling properties of land surface heterogeneity, multi-objective calibration of land surface models, and the demonstration of hydrologic and water resource applications for spaceborne soil moisture retrieval. Has expertise in data assimilation, surface water and energy balance modeling, and remote sensing.

**Dr. Craig S.T. Daughtry**

Research Agronomist  
Room 122A, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-5015  
email: [cdaughtry@hydrolab.arsusda.gov](mailto:cdaughtry@hydrolab.arsusda.gov)

Measures and models the spectral and biophysical characteristics of vegetation and soils. Develops reflectance and fluorescence techniques for assessing crop and soil conditions. Develops remote sensing methods to measure crop residue cover.

## Hydrology and Remote Sensing Laboratory

### **Dr. Paul C. Doraiswamy**

Agricultural Meteorologist  
Room 121A, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-6576  
email: pdoraiswamy@hydrolab.arsusda.gov

Conducts research in the retrieval and integration of vegetation parameters from remotely sensed data with simulation models to assess crop condition and yields at local and regional scales. Uses biogeochemical models to study the impact of soil and crop management practices on potential soil carbon sequestration, erosion and productivity. Has expertise in agricultural meteorology, remote sensing and crop management.

### **Dr. Timothy J. Gish**

Soil Scientist  
Room 127A, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-8378  
email: tgish@hydrolab.arsusda.gov

Major research efforts focus on quantifying agricultural chemical fate as a function of management practice, landscape position, and climate. Particular interests deal with determining chemical fluxes (including preferential flow) through soil. Has expertise in soil physics, mathematics, soil chemistry, and water resources.

### **Dr. E. Raymond Hunt, Jr.**

Physical Scientist  
Room 101, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-5278  
email: erhunt@hydrolab.arsusda.gov

Develops new techniques using remote sensing for detection of invasive weeds. Develops algorithms for NASA's Moderate-resolution Imaging Spectroradiometer (MODIS) remote sensing for determination of vegetation water content. Combines remote sensing data with computer simulation models and meteorological data to estimate carbon sequestration during agricultural production.

### **Dr. Thomas Jackson**

Hydrologist  
Room 117, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-8511  
email: tjackson@hydrolab.arsusda.gov

Conducts research on remote sensing techniques and methods for use in hydrology. Major research involves the use of microwave remote sensing for the measurement of soil moisture. Studies include large-scale experimentation and the development of satellite technology and data retrieval methods. Has expertise in hydrology, water resources, and remote sensing.

### **Dr. William P. Kustas**

Hydrologist  
Room 102, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-8498  
email: bkustas@hydrolab.arsusda.gov

Conducts research in the field of hydro-meteorology and remote sensing. Major interests include the application of remote sensing with land-atmosphere-transfer schemes for regional scale energy flux estimation. Studies the effects of landscape heterogeneity on remotely sensed data and land surface-atmosphere coupling. Develops techniques to account for the impacts of up-scaling on model-derived energy exchanges important in large scale hydrology.

### **Dr. Jerry C. Ritchie**

Soil Scientist  
Room 110A, Bldg. 007, BARC-West  
Beltsville, Maryland 20705-2350  
301/504-8717  
email: jritchie@hydrolab.arsusda.gov

Major research efforts are on the use of remote sensing to measure landscape properties, the use of native grasses to improve soil conditions and control soil erosion, the use of tracers to measure soil erosion patterns, and the development of techniques to evaluate carbon sequestration on agricultural lands.

## **Hydrology and Remote Sensing Laboratory**

### **Dr. Charles L. Walthall**

Physical Scientist

Room 120B, Bldg. 007, BARC-West

Beltsville, Maryland 20705-2350

301/504-6074

email: [cwalthall@hydrolab.arsusda.gov](mailto:cwalthall@hydrolab.arsusda.gov)

Develops remote sensing techniques that address agriculture, forestry and environmental quality information needs.

Analyzes relationships between sensor reading and the states and processes of the soil-plant-atmosphere system using measurements and models.

**INSTRUMENTATION AND SENSING LABORATORY  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350  
PHONE 301/504-8450      FAX 301/504-9466**

**Mission:** The mission of the Instrumentation and Sensing Laboratory is to conduct research to develop new and innovative instrumentation and sensors that are useful to agriculture and U.S. consumers, by applying state-of-the-art technologies of electronics, optics, laser, computers, pattern recognition, and artificial intelligence. The laboratory conducts basic research to characterize the physical, chemical, biological, and aesthetic properties of agricultural commodities, and develops nondestructive, noninvasive, and rapid techniques to measure those properties that are indicative of the post-harvest quality and safety of agricultural commodities.

**Dr. Yud-Ren Chen**

Research Leader  
Supervisory Agricultural Engineer  
Room 001A, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
301/504-8450  
email: chen@ba.ars.usda.gov

Machine vision and spectroscopic techniques for on-line detection of diseases, defects, and contamination on poultry and plant produce. Non-destructive, non-invasive, and rapid systems to measure the attributes that comprise the post-harvest quality and safety of agricultural commodities. Developing rapid on-line quality and safety inspection systems for animal carcasses and plant produce.

**Dr. Kuanglin (Kevin) Chao**

Agricultural Engineer  
Room 012, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
301/504-8450  
email: chaok@ba.ars.usda.gov

Machine vision technologies to rapidly measure the safety and quality characteristics of poultry viscera and carcasses. Systems engineering for development of automated poultry inspection systems. Developing rapid on-line systems for inspecting diseases, defects, and contamination on animal carcasses.

**Dr. Stephen R. Delwiche**

Agricultural Engineer  
Room 015-E, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
301/504-8450  
email: delwiche@ba.ars.usda.gov

Methods for the non-destructive measurement of physical, biochemical, and morphological properties of grains and their constituents. Characterizing the kernel-to-kernel variability in the composition of grains using spectrophotometric techniques.

**Dr. Moon S. Kim**

Biophysicist  
Room 011, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
301/504-8450  
email: kimm@ba.ars.usda.gov

Hyperspectral and multispectral imaging, and laser-induced fluorescence methods for rapid, safety assessments of agricultural products. Developing on-line and portable optical sensor systems for food safety and security inspections at food processing plants.

## **Instrumentation and Sensing Laboratory**

### **Dr. Alan M. Lefcourt**

Biomedical Engineer  
Room 007, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, Maryland 20705  
301/504-8450  
email: [alefcour@anri.barc.usda.gov](mailto:alefcour@anri.barc.usda.gov)

Development of systems for detection of contamination of foods and food preparation surfaces. Primary areas of interest include use of hyperspectral and laser-induced imaging to develop algorithms for detecting fecal contamination, development of mechanical systems to orient produce for imaging, and synthesis of detection and orientation methods into commercially-viable products.

**SUSTAINABLE AGRICULTURAL SYSTEMS LABORATORY**  
**ANIMAL AND NATURAL RESOURCES INSTITUTE**  
**BELTSVILLE, MARYLAND 20705-2350**  
**PHONE 301/504/6873      FAX 301/504-6491**

**Mission:** The Sustainable Agricultural Systems Lab determines principles and practices that support the development of sustainable agricultural systems. Emphasis is placed on multi-disciplinary research to understand fundamental agro-ecological processes underlying the functioning of sustainable systems. Communication with the community of growers, suppliers, information specialists, and consumers that value sustainable agriculture is integral to the definition of research problems and the transfer of technology.

**Dr. John R. Teasdale**

Research Leader, Sprvsy. Plant Physiologist  
Bldg. 001, Rm 245, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-6873  
FAX: (301) 504-6491  
email: Teasdale@ba.ars.usda.gov

Conducts a personal research program to develop sustainable cover crop and integrated weed management systems and to understand processes underlying weed population dynamics within sustainable agro-ecosystems.

**Dr. Aref A. Abdul-Baki**

Research Plant Physiologist  
Bldg. 001, Rm 119, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-5057  
FAX: (301) 504-8370  
email: Abdul-Ba@ba.ars.usda.gov

Develops alternative systems in the production of vegetables and management of orchards by using cover crops and no-tillage with focus on reducing chemical input, improving soil fertility, and reducing soil erosion and compaction. Develops cover crop management approaches to synchronize nitrogen mineralization and release by cover crop residues in accordance with vegetable crop need.

**Dr. Jeffrey S. Buyer**

Research Chemist  
Bldg. 001, Rm 124, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-8436  
FAX: (301) 504-8370  
email: BuyerJ@ba.ars.usda.gov

Evaluates microbial community structure and diversity in soil rhizosphere by analysis of 16S ribosomal DNA and lipid biomarkers to compare the microbial impacts of various conventional and alternative agricultural systems. Develops new methods for identification of bacteria and characterization of microbial communities.

**Dr. Michel Cavigelli**

Research Soil Scientist  
Bldg. 001, Rm 118, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-8327  
FAX: (301) 504-8370  
email: CavigelM@ba.ars.usda.gov

Coordinates the Farming Systems Project, a long-term evaluation of the sustainability of five cropping systems, organic and conventional. Project addresses various aspects of sustainability including: agronomic factors (crop yields etc.), environmental impact (carbon, nitrogen and phosphorus balances; greenhouse gas production; nitrate leaching potential), soil biology dynamics (soil invertebrate communities, weed seedbank dynamics), and economics.

## **Sustainable Agricultural Systems Lab**

### **Dr. C. Benjamin Coffman**

Agronomist

Bldg. 001, Rm 121, BARC-West

Beltsville, MD 20705

PH: (301) 504-5398

FAX: (301) 504-8370

email: CoffmanC@ba.ars.usda.gov

Conducts weed management and crop production research in organic and conventional systems. Field manager and coordinator for BARC sustainable agriculture research program. Organizes outreach programs for small farmers.

### **Dr. Thomas E. Devine**

Research Geneticist

Bldg. 001, Rm 226, BARC-West

Beltsville, MD 20705

PH: (301) 504-6375

FAX: (301) 504-6491

email: DevineT@ba.ars.usda.gov

Conducts research on soybean genetics and breeding. Breeds soybeans for use as forage and as a vegetable in organic production systems. Breeds grain soybeans for enhanced crop residue production to reduce soil erosion. Breeds hairy vetch and subterranean clover for use as green manure and cover crops.

### **Dr. Donald T. Krizek**

Research Plant Physiologist

Bldg. 001, Rm 117, BARC-West

Beltsville, MD 20705

Ph: (301) 504-5324

FAX: (301) 504-8370

email: KrizekD@ba.ars.usda.gov

Develops sustainable systems for production of high value crops under protected cultivation. Determines interactions of biotic and abiotic stresses and evaluates the use of selective UV filters and compost as IPM tools in high tunnel cropping systems. Provides expertise in the areas of UV-B radiation, stress physiology, and environmental monitoring.

### **Dr. Yao-Chi Lu**

Research Agricultural Economist

Bldg. 001, Rm 120, BARC-West

Beltsville, MD 20705

Ph: (301) 504-5821

FAX: (301) 504-6491

email: LuY@ba.ars.usda.gov

Provides expertise in the economics of technological changes and technology assessment. Conducts project on economic evaluation of sustainable agricultural systems. Integrates economic models with soil and crop growth models to evaluate profitability and sustainability of sustainable agricultural projects at BARC and typical farms in the Mid-Atlantic region.

### **Dr. John Lydon**

Research Plant Physiologist

Bldg. 001, Rm 227, BARC-West

Beltsville, MD 20705

Ph: (301) 504-5379

FAX: (301) 504-6491

email: LydonJ@ba.ars.usda.gov

Conducts research on the biological control of invasive weeds. Emphasis is on characterizing and enhancing the activity of biological agents.

## **Sustainable Agricultural Systems Lab**

### **Dr. Autar Mattoo**

Research Plant Physiologist  
Bldg 001, Room 329, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-6622  
FAX: (301) 504-6491  
Email: MattooA@ba.ars.usda.gov

Develops fundamental, molecular information on cross talk between plant hormones, signaling pathways and regulatory genes involved in nutrient accumulation, fruit ripening, senescence, programmed cell death, and plant responses to environmental extremes. Investigates integration of genetically engineered vegetable crops into sustainable, alternative agriculture using biochemical, molecular genetics and biotechnological approaches. Functional genomics and proteomics are used for gene discovery and transcriptional regulation.

### **Dr. Patricia Millner**

Microbiologist  
Bldg. 001, Rm 122, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-8387  
FAX: (301) 504-6491  
email: MillnerP@ba.ars.usda.gov

Conducts basic and applied research on soil microbes and microbially-mediated processes that can be used to improve and preserve soil, water, and air quality in sustainable agroecosystems. Develops and applies basic knowledge to prevent pathogen survival and dispersal from manure, biosolids and other byproducts to soils and water. Investigates the relation of farming practices on arbuscular mycorrhizal fungi, root pathogens and saprophytic microbes in roots and soil. Develops methods to identify microbes

### **Dr. Daniel P. Roberts**

Microbiologist  
Bldg. 001, Rm 228, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-5680  
FAX: (301) 504-6491  
email: RobertsD@ba.ars.usda.gov

Develops alternative biologically-based control measures for soilborne pathogens of vegetable crops. Conducts basic research on the means by which biological control microorganisms associate with plants and suppress disease.

### **Dr. Sara Wright**

Research Soil Scientist  
Bldg. 001, Rm 123, BARC-West  
Beltsville, MD 20705  
PH: (301) 504-8156  
FAX: (301) 504-8370  
email: WrightS@ba.ars.usda.gov

Conducts research on arbuscular mycorrhizal fungi (AM) fungi. Basic and applied biological studies include quantification and analysis of glomalin, the AM-specific glycoprotein involved in soil stabilization.



**SERVICE UNITS**  
**ANIMAL AND NATURAL RESOURCES INSTITUTE**  
**BELTSVILLE, MARYLAND 20705-2350**

**VETERINARY SERVICES UNIT**

**Mission:** This unit is responsible for care and welfare of all experimental animals at the Beltsville Agricultural Research Center and provides program guidance for health, quarantine, and other regulations.

**Dr. William Hare**  
Veterinary Medical Officer  
Bldg. 177C, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-9081  
FAX: 301/504-8746  
email: whare@anri.barc.usda.gov

Provides program support to scientists conducting studies with or involving all species of animals by diagnosis of pathological conditions, plans and initiates therapy, develops and carries out health programs, performs routine and experimental surgery as needed or requested, and provides reproductive and obstetrical care. Administers Federal and State regulations related to the purchase, sale, and transport of domestic animals; carries out the federal and State testing for herd certification; carries out mandatory regulations regarding laboratory animals covered under Public Law 89-544.

**ADMINISTRATIVE SERVICE UNIT**

**Mission:** Provides administrative support service to ANRI management units.

**Ms. Lynn Windsor**  
Management Analyst  
Bldg. 209, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301-504-8202  
FAX: 301/504-8696  
email: lwindsor@anri.barc.usda.gov

This unit is responsible for the budget, accounting, and contracting activities for ANRI.

**POSTDOCTORAL AND VISITING SCIENTISTS  
ANIMAL AND NATURAL RESOURCES INSTITUTE  
BELTSVILLE, MARYLAND 20705-2350**

**ANIMAL IMPROVEMENT PROGRAMS LAB**

none

**ANIMAL MANURE & BY-PRODUCTS LAB**

**Dr. Zehava Yehuda**

Postdoctoral Research Associate

Agronomist

Bldg. 007, Rm. 218A, BARC-West

10300 Baltimore Avenue

Beltsville, MD 20705-2350

301/504-7830

email: [yehudaz@ba.ars.usda.gov](mailto:yehudaz@ba.ars.usda.gov)

Focus is on the role of phytosiderophores secreted by grasses in susceptibility to heavy metal toxicity of these species.

## **Postdoctoral and Visiting Scientists Con't**

### **ANIMAL AND PARASITIC DISEASES LAB**

#### **Cathleen Coss**

Research Associate  
Bldg. 1044, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-5558  
email: [ccoss@anri.barc.usda.gov](mailto:ccoss@anri.barc.usda.gov)

Characterizing *Toxoplasma gondii* oocysts and development of sporozoites. Developing stage specific assays to aid in determining mode of *Toxoplasma* infection in animals.

#### **Ingrid Asmundsson**

Research Biologist  
Bldg. 1180, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8530  
email: [asmundsson@anri.barc.usda.gov](mailto:asmundsson@anri.barc.usda.gov)

Studies the genetics and epidemiology of parasite populations.

#### **Yeong H. Hong**

Research Molecular Biologist  
Bldg. 1043, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8771  
email: [yhong@anri.barc.usda.gov](mailto:yhong@anri.barc.usda.gov)

Investigate immune mechanisms which control coccidiosis resistance using functional genomics and molecular biology tools. Develops a real-time PCR technique to assess host immune responses to recombinant vaccination and natural infection. Clone and investigate biological function of host effector molecules which activate innate immunity against intracellular pathogens.

## **Postdoctoral and Visiting Scientists Con't**

### **BIOTECHNOLOGY AND GERMPLASM LAB**

#### **Dr. Jeremy R. Miles**

Postdoctoral Scientist (Swine/Poultry)

Bldg. 200, Rm. 101A, BARC-East

10300 Baltimore Avenue

Beltsville, MD 20705-2350

(301) 504-5242

email:jmiles@anri.barc.usda.gov

Applying Serial Analysis of Gene Expression (SAGE) to analyze comparative developmental progressions between the transcriptomes of in vivo and in vitro derived pig embryos.

#### **Dr. Jesús Peláez**

Postdoctoral Scientist

Bldg. 200, Rm 100C, BARC-East

10300 Baltimore Avenue

Beltsville, MD 20705-2350

(301) 504-9833

email:jpelaez@anri.barc.usda.gov

Characterizing the surface glycoproteins in poultry sperm membranes and investigating how these membranes components are altered during the cryopreservation process, with the aim of improving the fertility of frozen/thawed poultry sperm.

## **Postdoctoral and Visiting Scientists Con't**

### **BOVINE FUNCTIONAL GENOMICS LAB**

#### **Dr. Adam Kauf**

Post Doctoral Scientist

Bldg. 1040, Rm. 105

10300 Baltimore Avenue

Beltsville, MD 20705-2350

(301) 504-8201

email: [akauf@anri.barc.usda.gov](mailto:akauf@anri.barc.usda.gov)

Investigate the host innate immune response during mastitis in dairy cattle. Work will focus on both the pathogenesis of mastitis as well as developing mechanisms to enhance the innate immune response and improve host resistance to intramammary infections.

#### **Dr. Lakshmi Matukumalli**

Visiting Scientist

Bldg. 200, RM. 125, BARC-East

10300 Baltimore Avenue

Beltsville, MD 20705-2350

(301) 504-5979

email: [lmaturum@anri.barc.usda.gov](mailto:lmaturum@anri.barc.usda.gov)

Development and implementation of high throughput bioinformatics software for analyzing expressed sequence tags. Implementation of machine learning in single nucleotide polymorphism discovery and analysis. Bioreactor design, installation and optimization of operating conditions for maximizing productivity. Purification methods for commercially important bio-molecules from complex fermentation broths.

## **Postdoctoral and Visiting Scientists Con't**

### **ENVIRONMENTAL MICROBIAL SAFETY LAB**

#### **Dr. Monica Santin**

Post Doctoral Scientist

Bldg. 173, Room 008A, BARC-East

Powder Mill Road

Beltsville, MD 20705-2350

301/504-6774

email: msantin@anri.barc.usda.gov

Develops molecular based methods for detection of zoonotic protozoan pathogens and conducts epidemiologic studies to determine the prevalence and sources of these organisms in food animals, wildlife, and surface waters.

#### **Dr. Denise Goens**

Post Doctoral Scientist

Bldg. 173, Room 209C, BARC-East

Powder Mill Road

Beltsville, MD 20705-2350

301/504-6036

email: dgoens@anri.barc.usda.gov

Characterization bovine enteroviruses in cattle and wildlife in the United States and to determine their suitability as vaccine vectors for bovine zoonotic agents. Rapid, portable detection of viruses from environmental samples and complex food matrices. Identify and determine infectivity of hepatitis E virus in cattle.

#### **Dr. Andrey Guber**

Visiting Scientist

Bldg. 177C, Room 104, BARC-East

Powder Mill Road

Beltsville, MD 20705-2350

301/504-5656

email: aguber@anri.barc.usda.gov

Develops the hillslope-scale model of manure-borne bacteria transport. Conducts laboratory and plot-scale experiments to determine parameters of this model and their relationship to environmental and management factors.

#### **Dr. Fernando San Jose Martinez**

Visiting Scientist

Bldg. 177C, Room 104, BARC-East

Powder Mill Road

Beltsville, MD 20705-2350

301/504-5656

email: fsanjose@anri.barc.usda.gov

Develops a new model to simulate scale effects on surface and subsurface colloid-facilitated agricultural contaminant transport.

## **Postdoctoral and Visiting Scientists Con't**

### **ENVIRONMENTAL QUALITY LAB**

#### **Dr. Justin R. Barone**

Postdoctoral Research Associate  
Research Physical Scientist  
Room 1-3, Bldg. 012, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
PH: 301.504.5905  
FAX: 301.504.5992  
email: BaroneJ@ba.ars.usda.gov

Develops value-added products from agricultural waste with a specific concentration on utilizing waste feathers from poultry. Research focuses on exploiting polymeric protein nature of feathers to make non-petroleum-based polymers and composites for use in automotive, building, packaging, agricultural, and biomedical applications.

#### **Dr. Carrie D. Graff**

Postdoctoral Research Associate  
Soil Scientist  
Room 205A, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
PH: 301.504.9835  
FAX: 301.504.5048  
email: GraffC@ba.ars.usda.gov

Evaluates and quantifies effects of conservation practices on nutrient and sediment loads in the Choptank River Basin as part of the Conservation Effects Assessment Project (CEAP). Develops research tools through modeling designed to aid in agricultural risk assessments, primarily identifying risk reduction from BMP implementation.

#### **Dr. W. Dean Hively**

Postdoctoral Research Associate  
Research Soil Scientist  
Room 214, Bldg. 007, BARC-West  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
PH: 301.504.9031  
FAX: 301.504.5048  
email: Hivelyd@ba.ars.usda.gov

Conducts research on phosphorous transformation and transport. Examines the influence of soil properties, hydrology, nutrient management, and riparian buffer zones on P fate. Collaborates on landscape analysis and modeling for impacts of conservation practices.

## **Postdoctoral and Visiting Scientists Con't**

### **FOOD TECHNOLOGY AND SAFETY LAB**

none

### **GROWTH BIOLOGY LAB**

#### **Dr. Alice Kuo**

Research Molecular Biologist

Building 200, Room 218

BARC East

Beltsville, Maryland 20705

301/504-5061

email: [akuo@anri.barc.usda.gov](mailto:akuo@anri.barc.usda.gov)

Fine mapping of economic trait loci affecting egg weight and sexual maturity in chickens. Identification of economically important genes and functional genomics in chickens.

#### **Dr. Ayesha Mahmood**

Research Bioengineer

Building 200, Room 217

BARC East

Beltsville, Maryland 20705

301/504-6201

email: [ayesha@anri.barc.usda.gov](mailto:ayesha@anri.barc.usda.gov)

Conducts research on the development of an artificial liver using ARS PICM-19 porcine liver stem cells. This research involves utilization of novel cell culture techniques that incorporate chemical and biological matrices into flow-through bioreactor systems in an effort to maximize growth, and enhance cellular differentiation and hepatic function.

#### **Dr. Monika Proszkowiec-Weglarz**

Postdoctoral Research Associate

Research Animal Scientist

Building 200, Room 218

BARC East

Beltsville, Maryland 20705

301/504-5061

email: [monika@anri.barc.usda.gov](mailto:monika@anri.barc.usda.gov)

Conducts research on establishing the genetic basis for regulating appetite and energy balance in poultry. Major research emphasis involves identification and characterization of the AMP-activated protein kinase pathway at the molecular level in chicken cells and tissues.



## **Postdoctoral and Visiting Scientists Con't**

### **HYDROLOGY AND REMOTE SENSING LAB**

#### **Dr. Fuqin Li**

Research Associate

Bldg. 007, Rm. 116, BARC-West

Beltsville, MD 20705-2350

301/504-7614

email: [fcl@hydrolab.arsusda.gov](mailto:fcl@hydrolab.arsusda.gov)

Conducts research on the thermal and microwave remote sensing application in agriculture. Research interests integrating satellite thermal infrared and passive microwave data for use in a land surface modeling scheme for estimating fluxes and develop an optical-passive microwave based drought product.

## **Postdoctoral and Visiting Scientists Con't**

### **INSTRUMENTATION AND SENSING LAB**

#### **Dr. Byoung-Kwan Cho**

Agricultural Engineer  
Research Associate  
Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8450  
email: chob@ba.ars.usda.gov

Developing advanced nondestructive, rapid, and real-time sensing technologies for quality and safety of agricultural and food products. Major research is food quality and safety evaluation using sensing systems, such as IR multispectral image, proton magnetic resonance, and non-contact ultrasound. Sensor design and construction using advanced signal/image processing and electronic technique.

#### **Dr. Fujian Ding**

Physicist  
Research Scholar, Visiting Scientist  
Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8450  
email: dingf@ba.ars.usda.gov

Hyperspectral and multispectral imaging technologies to assess safety and quality of agricultural produce and animal carcasses. Developing rapid on-line inspection systems using multispectral laser-induced fluorescence and multispectral reflectance imaging technologies.

#### **Dr. Yongliang Liu**

Chemist  
Research Scholar, Visiting Scientist  
Room 015-B, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8450  
email: liuy@ba.ars.usda.gov

Spectroscopic and imaging spectroscopic technologies for the safety and quality evaluation of agricultural and food products. Identifying the characteristic bands and conducting classification / prediction analysis from visible/NIR/FT-IR/FT-Raman/imaging spectra, aiming to implement these technologies in process control of meat, vegetable and fruit.

#### **Dr. Lester O. Pordesimo**

Agricultural Engineer  
Research Associate  
Room 015-H, Bldg. 303, BARC-East  
10300 Baltimore Avenue  
Beltsville, MD 20705-2350  
301/504-8450  
email: pordesil@ba.ars.usda.gov

Developing near infrared spectroscopic procedures for rapid measurement of such specific soybean constituents as fatty acids (oleic, linolenic, palmitic), amino acids (methionine, cysteine), and phytate that can be used at commodity level transactions and in plant breeding selections.

## **Postdoctoral and Visiting Scientists Con't**

### **Dr. Chun-Chieh Yang**

Agricultural Engineer

Research Scholar, Visiting Scientist

Room 015-C, Bldg. 303, BARC-East

10300 Baltimore Avenue

Beltsville, MD 20705-2350

301/504-8450

email: yangc@ba.ars.usda.gov

Integration of multispectral and hyperspectral image acquisition instruments and image processing, analysis, and recognition techniques to develop a real-time on-line system for disease detection and classification of poultry carcasses, for agricultural product quality and food safety control.

## Postdoctoral and Visiting Scientists Con't

### SUSTAINABLE AGRICULTURAL SYSTEMS LAB

#### **Dr. Tahira Fatima**

Visiting Scientist

Bldg 001, Room 010, BARC-West

Beltsville, MD 20705-2350

301-504-0287

email: FatimaT@ba.ars.usda.gov

Conducts research addressing molecular mechanisms involved in the improved nutritional quality of tomato fruit generated by fruit-specific expression of higher polyamines, spermidine and spermine. Uses transgenic fruit and lines to elucidate cross talk and cellular networking between polyamines and other growth regulators that impact the fruit ripening process.

#### **Dr. V. Steven Green**

Research Associate

Bldg. 001, Room 010, BARC-West

Beltsville, MD 20705-2350

301-504-6029

email: GreenS@ba.ars.usda.gov

Conducts research on the relative environmental impacts associated with carbon, nitrogen, and phosphorus cycles in conventional till, no-till, and organic cropping systems.

#### **Dr. Beth L. Hima**

Research Associate

Bldg. 001, Room 201, BARC-West

Beltsville, MD 20705-2350

301-504-5709

email: HimaB@ba.ars.usda.gov

Conducts research on the economics of sustainable agricultural systems. Integrates economic models with biophysical simulation models to evaluate profitability and sustainability of agricultural enterprises. Conducts economic analysis of the Farming Systems Project at BARC.

#### **Muhammet Topuz**

Visiting Scientist

Bldg. 001, Room 010A, BARC-West

Beltsville, MD 20705-2350

301-504-0287

email: TopuzM@ba.ars.usda.gov

Studies towards a Ph.D. researching fitness ability of weeds, particularly relation between seed dormancy, herbicide resistance and hormones. His model plant is *Sinapis arvensis* (Wild mustard), which is one of the major weeds in wheat fields in Turkey.